

CLAIMS

1. An engine exhaust system for a vehicle, comprising:

at least two flexible couplings (6, 7) having elastic characteristics, positioned at two different locations in the exhaust system; and

an intermediate component (2, 3, 11) positioned between the at least two flexible couplings (6, 7) and having mass;

characterised in that a dynamic damper is formed by virtue of the elastic characteristics and the mass.

2. The exhaust system of claim 1, wherein the elastic characteristics of the flexible couplings (6, 7) are selected to optimize the resonant frequency of the dynamic damper.

3. The exhaust system of claim 1 or claim 2, wherein the mass of the intermediate component (2, 3, 11) is selected to optimize the resonant frequency of the dynamic damper.

4. The exhaust system of any preceding claim, wherein each of the at least two flexible couplings (6, 7) includes a spherical joint.

5. The exhaust system of any preceding claim, wherein an upstream flexible coupling (6) has a first elastic characteristic, a downstream flexible coupling (7) has a second elastic characteristic, the intermediate component (2, 3, 11) positioned between the upstream flexible coupling (6) and the downstream flexible coupling (7) is separated from a body of the vehicle, and a downstream component (4, 5) positioned further downstream of the

downstream flexible coupling (7) is mounted (10) to the body of the vehicle.

6. The exhaust system of claim 5, the system being arranged to be positioned between an engine (1) and a muffler (5), wherein the upstream flexible coupling (6) is closer to the engine (1) than to the muffler (5), the downstream flexible coupling (7) is closer to the muffler (5) than to the engine (1), and the downstream component (4) is positioned between the downstream flexible coupling (7) and the muffler (5), the downstream component (4) being mounted (10) to the body of the vehicle.

7. The exhaust system of any preceding claim, wherein one flexible coupling (6) has an elastic characteristic (k_1) and another flexible coupling (7) has an elastic characteristic (k_2), the elastic characteristics (K_1 , K_2) being selected such that a resonant frequency (f) of the section formed by the flexible couplings (6, 7) and the intermediate component (2, 3, 11) is lower than 30Hz.

8. The exhaust system of any preceding claim, wherein the intermediate component (2, 3, 11) has a mass (M) which is selected such that a resonant frequency of the section formed by the flexible couplings (6, 7) and the intermediate component (2, 3, 11) is lower than 30 Hz.

9. An engine exhaust system for a vehicle, comprising:

at least two flexible couplings having elastic characteristics, positioned at two different locations in the exhaust system; and

an intermediate component positioned between the at least two flexible couplings and having mass so that a dynamic damper is formed by virtue of the elastic

characteristics and the mass.

10. An engine exhaust system for a vehicle according to claim 9, wherein the elastic characteristics of the flexible couplings are selected to optimize the resonant frequency of the dynamic damper.

11. An engine exhaust system for a vehicle according to claim 9, wherein the mass of the intermediate component is selected to optimize the resonant frequency of the dynamic damper.

12. An engine exhaust system for a vehicle according to claim 9, wherein each of the at least two flexible couplings includes a spherical joint.

13. An engine exhaust system for a vehicle, the vehicle having a body, the system comprising:

an upstream flexible coupling having a first elastic characteristic;

a downstream flexible coupling having a second elastic characteristic;

an intermediate component positioned between the upstream flexible coupling and the downstream flexible coupling and having a mass, the intermediate component being separated from a body of the vehicle; and

a downstream component positioned further downstream of the downstream flexible coupling, the downstream component being mounted to the body of the vehicle.

14. An engine exhaust system for a vehicle according to claim 13, wherein the elastic characteristics of the flexible couplings are selected to optimize the resonant frequency

of the vibration system formed of the couplings and the intermediate component.

15. An engine exhaust system for a vehicle according to claim 13, wherein the mass of the intermediate component is selected to optimize the resonant frequency of the vibration system formed of the couplings and the intermediate component.

16. An engine exhaust system for a vehicle according to claim 13, wherein each of the upstream flexible coupling and the downstream flexible coupling includes a spherical joint.

17. An engine exhaust system to be positioned between an engine and a muffler of a vehicle having a body, the system comprising:

an upstream flexible coupling closer to the engine than to the muffler;

a downstream flexible coupling closer to the muffler than to the engine;

an intermediate component positioned between the upstream flexible coupling and the downstream flexible coupling, the intermediate component being separated from the body of the vehicle; and

a downstream component positioned between the downstream flexible coupling and the muffler, the downstream component being mounted to the body of the vehicle.

18. An engine exhaust system for a vehicle according to claim 17, wherein each of the upstream flexible coupling and the downstream flexible coupling includes a spherical joint.

19. An engine exhaust system for a vehicle according to claim 17, wherein the upstream

flexible coupling has a first elastic characteristic and the downstream flexible coupling has a second elastic characteristic, the first and second elastic characteristics being selected such that a resonant frequency of the section formed by the upstream flexible coupling, the downstream flexible coupling, and the intermediate component is lower than 20-30Hz.

20. An engine exhaust system for a vehicle according to claim 17, wherein the intermediate component has a mass which is selected such that a resonant frequency of the section formed by the upstream flexible coupling, the downstream flexible coupling, and the intermediate component is lower than 20-30Hz.

21. An engine exhaust system for a vehicle according to claim 9 or claim 13 wherein the mass of the intermediate component and/or the elastic characteristics of the flexible couplings are selected to optimise the resonant frequency of the dynamic damper.